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FOREST INSECT CONDITIONS
AND
ENTOMOLOGICAL SERVICE ACTIVITIES
NORTH IDAHO AND MONTANA
1950

Forest Insect Laboratory
Coeur d'Alene, Idaho
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FOREST INSECT CONDITIONS
AND
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NORTH IDAHO AND MONTANA
1950

by
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Division of Forest Insect Investigations

For many years the Forest Insect Laboratory has prepared a report of forest insect conditions within the forests of north Idaho and Montana. This year's report includes brief summaries of the forest insect surveys and control activities as conducted during the 1951 season. The story of insect conditions may not be complete, although it is believed that information is available as to all dangerous situations. However, in the 40,000,000 acres of forest land that are in this laboratory area, there may be some potentially dangerous situations that have not been discovered.

Information for this annual report is drawn from all available sources. An increased laboratory program of forest insect surveys in 1949 and 1950, provided detailed data for many specific areas. Many reports of abnormal forest insect conditions were received from public and private land managing agencies. These reports are of great importance, and more emphasis must be given to them. In many instances they have provided the first record of situations that subsequently proved to be destructive forest insect outbreaks.

Obtaining complete forest insect information for all forested areas is not a simple task. To meet this obligation the Coeur d'Alene Laboratory depends upon the cooperation of all forest land managing agencies. Without this assistance a large force of men would be required to cover once each year, areas that are under rather constant surveillance of local managing personnel. With this cooperation obtained, an unnecessary duplication of effort will be avoided, and a more effective coverage obtained.

Initial reports of abnormal forest insect conditions are considered as "detection surveys". Such surveys may be planned aerial or ground projects, or they may be incidental to other assigned work. Doubtful conditions as well as obviously important ones should be reported. Perhaps many such borderline situations will prove to be of no importance, but when once reported, it is the responsibility of this laboratory to determine their seriousness. A field notebook report form will be provided to facilitate the recording of the information desired, at the time the situation is observed. All reports will be acknowledged, with the laboratory's reaction to the situation and the follow-up action that is to be taken.

UNUSUAL FOREST CONDITIONS CONTRIBUTING TO CHANGES IN INSECT POPULATIONS

Windthrown Trees - A severe windstorm in November 1949 resulted in much damage to the forests of northern Idaho and northwestern Montana. This damage consisted of variable sized areas of nearly complete blowdown of merchantable timber, and as small scattered groups and single trees. Its seriousness was not fully appreciated until late spring as heavy snows covered the damaged areas. Aerial survey conducted by land managing agencies showed severely damaged areas, but very few of the small groups and single trees could be seen. As detailed examinations were necessary of all areas, it was not until early summer that a fairly complete story as to the severity of the blowdown was available.

Windthrown trees contribute to the building of epidemic infestations from low level bark beetle populations. This is especially true of white pine, Engelmann spruce, and Douglas fir windfalls, which are attacked by *Dendroctonus* beetles in preference to standing trees. Windthrown white pine and Douglas fir trees will remain suitable for bark beetle attacks throughout the first summer season. Spruce windfalls remain in this condition for two subsequent seasons. In addition to becoming a preferred host, windfalls lose their resistance to bark beetle attack that they possessed as standing trees. A few beetles can make successful attacks and produce large broods in windfalls, while large numbers of beetles are required to overcome the resistance of standing trees. This fact alone makes all windfalls a serious threat in the development of bark beetle outbreaks.

White Pine - Concentrated areas of white pine blowdown were recorded by the aerial survey on the Clearwater, St. Joe, Coeur d'Alene, Kaniksu, Kootenai, and Flathead national forests. There are also unknown numbers of small groups and single windthrown white pine trees scattered throughout these forests. Areas that were not to be salvaged prior to July 1951, were examined by the personnel of the Coeur d'Alene Laboratory. In most areas it was found that the number of windfalls greatly exceeded the capacity of the mountain pine beetle (*Dendroctonus monticola* Hopk.) to make normal attacks. Not only were the attacks light, but less than two-thirds of the blown-over trees were infested. Attacks of the mountain pine beetle in standing white pine trees will average from 7 to 11 per square foot of bark surface. In most of the windthrown pine examined there were only from 25 to 75 individual attacks per tree.

Engelmann Spruce - There are large areas of spruce blowdown in northern Idaho and western Montana with scattered small groups and individual trees. Examinations were made by the Coeur d'Alene Laboratory of all areas that were not being salvaged. These examinations showed the attacks of the Engelmann spruce beetle (*D. engelmanni* Hopk.) in these windthrown trees to vary materially in numbers. In one area on the Kaniksu National Forest nearly all the spruce windfalls were rather heavily attacked by this destructive bark beetle. In this area it was apparent that a fairly heavy beetle population existed at the time of the November 1949 windstorm. Fortunately, this condition did not prevail throughout the other areas examined.

Individual attacks of the Engelmann spruce beetle in standing trees will average from 8 to 10 per square foot of bark surface. In comparison, the average infestation in the windthrown spruce within the areas examined would not be more than 50-75 individual attacks per tree. No serious losses in standing spruce from attacks of this beetle are expected during the 1951 season. Although a few standing trees may be attacked, most of the emerging beetles will reattack the still green windfalls. The real danger from the windthrown spruce will rest in the beetle population that will emerge in 1952.

Douglas Fir - There were no large concentrations of Douglas fir blowdown, except as this tree species was associated with other damaged forest types. The story of Douglas fir beetle (D. pseudotsugae Hopk.) attacks in windfalls of this tree species, is not unlike that of white pine and spruce. Douglas fir beetle attacks of the Douglas fir windfalls were quite light and many trees were uninfested. Although there are no large areas of Douglas fir windfalls, their importance in building destructive populations of the Douglas fir beetle is fully appreciated and feared.

Unusual Winter Temperatures

To withstand winter temperatures insects develop a resistance or hardiness that protects them against normal conditions. When this resistance is broken by a period of unusual warm winter weather which is followed by normal temperatures, mortality in insect life may follow. The degree of mortality is dependent upon the departures of winter temperatures from the normal.

Several days of warm weather in March 1950 followed by zero temperatures, gave indications of an abnormal mortality in the overwintering broods of the mountain pine beetle. Field examinations were made of all infested areas for which control measures had been planned for the spring of 1950. Data obtained showed a variable mortality in lodgepole pine, which in a number of areas was sufficient to warrant the cancellation of planned control. No mortality was recorded in white pine.

DETECTION SURVEYS TO DETECT EARLY STAGES OF INJURIOUS FOREST INSECT OUTBREAKS

In the northern Rocky Mountains there are several species of tree killing bark beetles, as well as forest defoliating insects, that are native to this country. Although these insects are present in our forests at all times, when held in check by natural forces of control, their destructiveness is minimized. Unfortunately, from time to time one or more of these forces fail, and natural balances are destroyed. When this occurs low level populations of destructive insects often build to epidemic proportions in a few years.

As detection surveys are the initial reports of abnormal forest insect conditions it would be most difficult to overemphasize their importance. From these reports potential insect epidemics can be foreseen, and control conducted at the most effective and economical time. It is essential that all situations be reported promptly, if subsequent action is to be taken during the same season.

During the 1950 season detection reports were received from a number of sources. These included both public and private land managing agencies, and resulted in a rather complete coverage of all forested areas. Although the data received contributed materially to a knowledge of forest insect conditions within the laboratory area, the record is not fully complete. In protection programs it is essential that the status of insect conditions be known for all forested areas. Such information can be most efficiently obtained through the cooperation of the managing agencies charged with the protection of specific forest areas. It is the desire of the Forest Insect Laboratory to develop this source of "detection surveys" to provide for a proper annual coverage of all forested areas. From a seasonal wide coverage by managing personnel it is hoped that prompt reports of all abnormal or unusual forest insect conditions will be received.

**SUMMARY TABULATION OF DETECTION SURVEYS
MADE BY COOPERATING AGENCIES DURING
1950 SEASON**

<u>Area</u>	<u>Insect</u>	<u>Tree Species</u>	<u>Remarks</u>
Cabinet N.F.			
St. Regis Dist.	Oregon Pine engraver	Lodgepole	Considered as increasing.
Plains Dist.	Oregon pine engraver	Ponderosa	About 20 acres, 20" trees.
Thompson Falls Dist.	Pine butterfly <i>Neophasia menapia</i>	Ponderosa	Two small patches of 1 acre each.
Custer N.F.			
Stillwater Dist.	Douglas fir beetle <i>Dend. pseudotsugae</i>	Douglas fir	160 Acres - Infestation spreading from north. Trees in groups of 10 or more.
Rock Creek Dist.	Twig borer	Lodgepole	Possibly <i>Pithophorus</i> sp.
Ashland Dist.	--	--	No infestations reported.
Ft. Howe Dist.	Oregon pine engraver Tip moth <i>Rhyacionia</i> sp.	Not listed Not listed	Not serious. Scattered throughout district. All small trees attacked.
Ekalaka Dist.	Black hills beetle <i>Dend. ponderosae</i>	Ponderosa	Few scattered trees.
Sioux Dist.	--	--	No infestations reported.

<u>Area</u>	<u>Insect</u>	<u>Tree Species</u>	<u>Remarks</u>
<u>Flathead N.F.</u>			
Tally Lake Dist.	Douglas fir beetle Dend. pseudotsugae	Douglas fir	Considered as severe. Common over entire District. Some areas associated with logging. No evidence of budworm.
Swan Lake Dist.	Spruce budworm Archips funiferana	White fir Alpine fir	6,000 acres infested. Considered as increasing. Scattered bark-beetle attacks.
Glacier View Dist.	Shoot Borer Pissodes Engelmanni	Engelmann spruce.	Rather severe damage on some 6,000 acres.
	Mountain pine beetle Dend. monticolae	White pine	Infestation in Canyon Creek.
Condon Dist.	Spruce budworm	Douglas fir Engelmann sp. White fir	Past losses heavy. 70,000 acres of budworm infest. Considered as becoming more severe.
	Oregon pine engraver Ips oregoni Bark beetles?	Ponderosa	Decreasing.
Spotted Bear Dist.	Spruce budworm	Douglas fir Ponderosa	Considered as increasing.
	Mountain pine beetle	Spruce, Douglas Fir, Alpine fir	Considered as decreasing in severity.
Coram Dist.	Spruce budworm	Lodgepole	Few scattered trees.
Big Prairie Dist.	Spruce budworm	Douglas fir, Spruce, Larch, Alpine fir.	Increasing in severity.
Schafer Dist.	--	--	Considered as decreasing in severity.
<u>Helena N.F.</u>			
Gallatin Dist.	Mountain pine beetle	Lodgepole	No infestations reported.
Big Timber Dist.	Douglas fir beetle	Douglas fir	Infested trees scattered throughout overmature lodgepole pine stands.
			Infestation several years old. Increasing in severity and spreading into new areas.

<u>Area</u>	<u>Insect</u>	<u>Tree Species</u>	<u>Remarks</u>
Kaniksu N.F. Sandpoint Dist.	Mountain pine beetle	Lodgepole and Ponderosa pine	Scattered trees and few small spot of infestation. Associated with logging in Boulder Creek sale.
Sullivan Lake Dist.	Bark beetles	Spruce	Windthrown area of white pine, spruce, and Douglas fir.
	Mountain pine beetle	White Pine.	One group of 15 new attacks recorded. Other evidence of new attacks.
Falls Dist.	—	—	No infestations.
Priest River Dist.	Dendroctonus sp.	White pine	Estimate current infestation at 200 trees on an area of 3,000 acres.
Clarks Fork Dist.	—	—	No infestation reported.
<u>Lewis & Clark N.F.</u>			
Lewistown Dist.	Dendroctonus sp.	Douglas fir	Infestation three years old. Decreasing.
Musselshell Dist.	Spruce budworm	Douglas fir Alpine fir	Infestation previously reported is now considered as decreasing.
	Mountain pine beetle	Ponderosa	Severe infestation of 1948 decreased to normal condition.
Teton Dist.	Spruce budworm	Douglas fir	Little 1950 damage reported.
Sun River Dist.	Spruce budworm	Douglas fir	Little 1950 damage reported.
Judith Dist.	Mountain pine beetle	Ponderosa	Reported 50 trees killed on 20 acre during 1950.
Bolt Creek Dist. White Sulphur Sp. Dist.	Spruce budworm	Douglas fir	No infestations. Scattered throughout district ~ 1950. Damage somewhat reduced.
	Douglas fir beetle	Douglas fir	Few scattered trees.
	Mountain pine beetle	Ponderosa	Few 1950 attacked trees.

<u>Area</u>	<u>Insect</u>	<u>Tree Species</u>	<u>Remarks</u>
Lolo N.F. Missoula Dist.	Mountain pine beetle	Lodgepole and ponderosa	No alarming infestations.
Lolo Dist.	--	--	Scattered groups of beetle killed trees.
Bonita Dist.	--	--	No infestation.
Ninemile Dist.	--	--	No infestation.
Powell Dist.	Fern sawfly Strongylogaster pacificus	Ponderosa	Larva of this insect hibernating in galleries constructed in outer bark.
Superior Dist.	Larch sawfly	Larch	Attack recorded as lighter in 1951.
Seeley Lake Dist.	Larch needle cast Spruce budworm	Larch Mixed species	No current evidence of disease. Current infestation light.
	Mountain pine beetle Douglas fir beetle Engelmann spruce Weevil	Ponderosa Douglas fir Spruce	Scattered - light Rather widespread damage to terminal growth of small trees.
Nezperce N.F.			
Slate Creek Dist.	Western Pine Beetle Dend. brevicomis	Ponderosa	Light scattered infestation.
Middlefork Dist.	Unknown	Douglas fir	Insect considered to be Douglas fir beetle. Infested trees occur in groups of 10 or more. Could be serious.
Cloarwater Dist.	Douglas fir beetle	Douglas fir	Scattered infestation associated with logging.
Salmon River Dist.	Spruce budworm	Douglas fir Grand fir	No current change Infestation scattered throughout entire District. Defoliation not heavy.
St. Joe N.F.			
Avery Dist.	--	--	No infestations reported.
Roundtop Dist.	Bark beetle?	White pine and spruce	Blowdown area.

<u>Area</u>	<u>Insect</u>	<u>Tree Species</u>	<u>Remarks</u>
<u>St. Joe N.F. Cont.</u>			
Canyon Dist.	Mountain pine beetle	White pine	Scattered groups of currently infested trees.
Red Ives Dist.	Mountain pine beetle	White pine Lodgepole pine	Increased damage in Gold and Quartz Creeks.
Palouse Dist.	Douglas fir beetle	Douglas fir	Scattered infestation appears to be more severe.
Clarkia Dist.	Willow borer <i>Cryptorhynchus lapathi</i>	Willow	Increasing in severity.
<u>Glacier National Park</u>			
Kintla Lake Dist.	Mountain pine beetle	Lodgepole	Current infestations averages .968 of an infested tree per acre. Considered serious.
Nyack River Dist.	Spruce budworm	Mixed species	Decreasing in severity.
<u>Yellowstone N. P.</u>			
All Ranger Dist.	--	--	No infestations reported.
Lewiston, Idaho	Spruce budworm	Mixed species	Increasing.
Clarkia, Idaho	Spruce budworm	--	No information.
Fairfield, Wash.	Mountain pine beetle Mountain pine beetle	White pine Ponderosa p.	Increased damage Rather heavy but confined infestation.
Flathead Indian Res.	Oregon pine engraver	Ponderosa	Spot kills of fair sized trees some scattered western pine beetle work. Associated with logging.

In addition to these reports of insect situations by cooperating agencies, the following planned detection surveys were made by personnel of the Coeur d'Alene Laboratory:

State and Private Timber East of Kalispell, Montana - 50,000 A. - Ground
Mountain pine beetle in lodgepole pine.
Douglas fir beetle in Douglas fir.

Flathead Indian Reservation - 25,000 A. - Ground.
Mountain pine beetle in lodgepole pine.
Western pine beetle in ponderosa pine.
Douglas fir beetle in Douglas fir.
Oregon pine engraver in ponderosa pine.

RECONNAISSANCE SURVEYS

To Obtain Information Concerning Infestations Which Will Determine the Need for Control

Reconnaissance surveys are the follow-ups of detection surveys, in instances where such action is considered necessary. They vary from an intensive examination by a forest entomologist to a systematic sampling of the area in question. They may be made from the ground or by aerial reconnaissance to obtain the desired information. Reconnaissance surveys are made by the Coeur d'Alene Laboratory, with the assistance of trained personnel from cooperating agencies whenever available.

Summary Tabulation of Reconnaissance Surveys Made by Forest Insect Laboratory 1950

Targhee National Forest - Mountain pine beetle in lodgepole pine.
142,000 acres covered by ground reconnaissance.

Payette National Forest - Western pine beetle in ponderosa pine.
1,382,000 acres covered by aerial reconnaissance.

Clearwater Area (Private Lands) - Mountain pine beetle in white pine.
117,000 acres covered by ground reconnaissance, with some sampling
to determine trend of infestation.

Bitterroot National Forest, Magruder District - Fading ponderosa pine
examined and found to be winter injury to foliage.

Helena National Forest, Lincoln Basin - Red turpentine beetle (Dend. Valens
Loc.) in ponderosa pine. Logging area.

Flathead National Forest, Holland Lake - Spruce budworm in Douglas fir,
and Douglas fir beetle in Douglas fir.

Glacier National Park

Waterton Lake - Low vigor lodgepole - considered to be natural
transition of tree species.

Kintla Lake - Douglas fir beetle in Douglas fir.

Nyack Lake - Spruce budworm in Engelmann spruce.

Cutback Creek - Winter injury to mountain hemlock foliage.

Fairfield, Washington - Ponderosa pine woodlot infested with mountain
pine beetle.

Pend Oreille Game Refuge, Colville, Washington - Winter injury to
ponderosa pine foliage - Douglas fir beetle in Douglas fir.

Colville National Forest, Echo Valley and Park Rapids - Winter injury of
ponderosa pine foliage - some western pine beetle in ponderosa pine
and Douglas fir beetle in Douglas fir.

Bison Range, Montana - Winter injury to ponderosa pine and Douglas fir. Some western pine beetle and Douglas fir beetle damage.

Cabinet National Forest, Plains, Dist. - Oregon pine engraver in ponderosa pine, associated with current logging operation.
St. Regis Dist. Oregon pine engraver in lodgepole pine.

Flathead Indian Reservation, Montana

Mission Range - Fading ponderosa pine, examined and found to be winter injury to foliage.

Dog Lake Area - Oregon pine engraver in ponderosa pine. Few scattered western pine beetle attacks. Associated with logging and sawmill operation.

Hot Springs Area - Oregon pine engraver in ponderosa pine. Associated with logging operation.

Coeur d'Alene Lake Area - Mica Bay - Red turpentine beetle in ponderosa pine.

Coeur d'Alene National Forest - Lost Creek - Douglas fir beetle in Douglas fir. Associated with logging.

Kootenai National Forest

Libby Creek - Fading ponderosa pine. Found to be winter injury to foliage.

Warland District - Douglas fir beetle in Douglas fir - associated with logging.

Solo Joe Creek - Mountain pine beetle in lodgepole pine.

Turnbull National Wildlife Refuge - Cheney, Washington. Oregon pine engraver in ponderosa pine previously injured by increased height of water table.

Targhee National Forest - Porcupine District - Needle miner in lodgepole pine.

APPRAISAL SURVEYS

To Obtain Information Essential
to the Planning of Control

Appraisal surveys are the final step in the process of locating and reporting of abnormal forest insect infestations leading to the conduct of control. They usually consist of an intensive sampling of the infestation, and are made by, or under the direction of the Coeur d'Alene Laboratory. The information obtained includes the location, size, and ownership of the infested area, the number, diameter, and height of the infested trees, and their occurrence in groups or as scattered trees.

The appraisal surveys of bark beetle infestations, as shown in the following tabulation, were of areas where conditions were considered as possibly warranting control.

Intensive Sample Strip Surveys of Bark Beetle Infested Areas

<u>Forest</u>	<u>Number of Areas</u>	<u>Acres of Area</u>	<u>Tree Species</u>	<u>Insect</u>	<u>Percent of Area Covored</u>	<u>Infested Trees Per A.</u>	<u>Control</u>
Beaverhead	1	8,540	L.P.P.	M.P.B.	5	.18	No
Boise-Payette	3	42,640	P.P.	W.P.B.	2.5	.11	Partial
Boise-Payette	1	4,200	L.P.P.	M.P.B.	3.0	.07	No
Cabinet	19	67,700	L.P.F.	M.P.B.	2-9	0-1.58	Partial
Clearwater	4	19,600	W.W.P.	M.P.B.	3 $\frac{1}{2}$ -6	.2-.5	Partial
Coeur d'Alene	8	26,000	W.W.P.	M.P.B.	5	.19-.65	Partial
Kaniksu	2	12,700	W.W.P.	M.P.B.	2-9	.10-.12	No
Kootenai	10	11,900	L.P.P.	M.P.B.	4-5	.03-.95	Partial
Payette	4	9,000	E.S.	E.S.B.	3-4	.04-.35	Yes
St. Joe	1	10,900	L.P.F.	M.P.B.	4	.03 W.P.	No
			W.W.P.			.41 L.P.F.	
Caribou	10	35,700	L.P.P.	M.P.B.	1 $\frac{1}{2}$ -3-3/4	0-.10	Partial
Targhee	23	85,000	L.P.P.	M.P.B.	2-8	0-.14	Partial
Teton	35	155,000	L.P.P.	M.P.B.	2-6	0-.11	Partial
Bridger	4	7,250	L.P.P.	M.P.B.	1	0-.03	No
Grand Teton Park	13	36,200	L.P.P.	M.P.B.	2-9	.0-.31	Yes
Custer	1	3,300	P.F.	B.H.B.	4.3	.01	No
Lewis and Clark	2	1,160	P.P.	M.P.B.	5	0	No

L.P.P. - Lodgepole Pine
 W.W.P. - Western White Pine
 P.P. - Ponderosa Pine
 E.S. - Engelmann Spruce

M.P.B. - Mountain Pine Beetle
 W.P.B. - Western Pine Beetle
 B.H.B. - Black Hills Beetle
 E.S.B. - Engelmann Spruce Beetle

Spruce Budworm Surveys

Spruce budworm infestations were first recorded in the northern Rocky Mountains in 1921. During subsequent years there has been an active infestation of this insect in some portion of this area at all times. In 1927 Forest Service reports listed some 790,000 acres of budworm infestation in northern Idaho. The actual damage that has resulted from these more or less continuous outbreaks has varied materially for different forests. The present budworm situation within this area has been the most serious on record. Information is available regarding all visible areas of budworm defoliation. The insect has also been recorded in areas where its feeding is apparent from close examinations only. Obviously there are other areas where it is present, and where subsequent defoliation may occur.

The surveys of budworm infestation, as shown in the following tabulation were for the most part limited to areas of severe defoliation.

<u>General Area of Infestation</u>	<u>First Report of Infestation</u>	<u>Acres of Infestation</u>	<u>Status of Infestation</u>
<u>North Idaho</u>			
West Central* Boundary	1946	25,000	Some portions 1950 defoliation severe.
<u>Montana</u>			
Lolo N.F.	1946	15,000	One small area new and severe in 1950. Remainder of area decreased in severity.
Deerlodge N.F.	1945	90,000	Some small areas severe defol- iation 1950. Rest of area damage reduced.
Gallatin N.F.	1941	26,000	General reduction in severity.
Helena N.F.	Continuous since 1925	290,000	Over most of area defoliation reduced. Few small areas (20,000 A.) of severe damage. Some new areas.
Flathead N.F.	1942	218,000	Reduced in severity. Some small areas of medium 1950 defoliation. 10,000 acres of severe damage.
Lewis & Clark N.F.	1944	50,000	Reported as being greatly reduced in severity.
Glacier Nat. Park	1945	5,000	Reduced in severity.

*Infestation extends north from Riggins, Idaho to timber area south of Lewiston, Idaho.

FOREST INSECT CONTROL PROJECTS

1950

The following artificial control projects were conducted during the 1950 season. These projects were directed against the mountain pine beetle in lodgepole pine. Technical service and supervision for these projects was provided by the Forest Insect Laboratory.

Cabinet National Forest - Thompson River Project.

Originally planned for 15 units of 51,000 acres, but reduced because of winter mortality of overwintering broods, to one unit of 4,100 acres. Most of work conducted in fall of 1949, and completed in June 1950.

Kootenai National Forest

Work planned for 10 units of 12,000 acres but subsequently reduced because of brood mortality to one area of 1,900 acres. Maintenance control was started on this area in the fall of 1950, but was not completed.

Targhee National Forest

A total of 130,000 acres were covered by control during the spring season. Following the 1950 survey of all areas, fall control was conducted on most of the 24,000 acres where such action was considered necessary.

Teton National Forest

Spring control covered a total of 34,300 acres, and the fall maintenance operation included all areas (2,400 acres) where control was needed.

Caribou National Forest

Spring control directed to 16,500 acres, with fall maintenance control recommended for 400 acres.

Grand Teton National Park

Spring control included 40,000 acres. Work on 10,500 acres recommended for the spring of 1951.

Projects directed toward the control of the mountain pine beetle in white pine on the Salmon-Challis and Clearwater National Forests were not conducted due to unforeseen circumstances.

CONCLUSIONS

Forest insect control is an important part of all forest protection programs. To be successful control projects must be preceded by an adequate program of forest insect surveys which provide information essential to an efficient direction. Detection surveys are again emphasized, as they show the early stages of forest insect outbreaks, and permit control to be economically and effectively conducted. Making detection surveys is not a task for the Forest Insect Laboratory alone. It is the problem of all forest land managing and technical service agencies. Cooperation in the prompt submission of reports of all abnormal forest insect conditions is respectfully requested. Let the forest entomologists determine if the condition observed warrants further consideration. That is their responsibility.